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ABSTRACT

This study evaluated the use of three systematic reinforcement techniques and measures (a carrel, teacher attention, and a contingency contract) to increase the on-task and task completion behaviors of a first-grade child. The carrel and teacher attention increased on-task behavior (from a mean of 27.6 percent to 45.0 percent) but did not affect the rate of task completion. The rate of task completion was increased when a contingency contract was introduced. Teacher social contacts were held consant in order to determine the effects of the contract. On-task level remained unchanged. When contract requirements were raised, on-task and task completion levels rose. Suggestions are made concerning the relationship between on-task and task completion behaviors. (Author/CS)

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Abstract

A carrel, teacher attention, and a contingency contract were used to increase the on-task and task completion behaviors of a first-grade child. The carrel and teacher attention increased on-task behavior (from a mean of 27.6 percent to 45.0 percent) but did not affect the rate of task completion. The rate of task completion was increased when a contingency contract was introduced. Teacher social contacts were held constant in order to determine the effects of the contract. On-task level remained unchanged. When contract requirements were raised, on-task and task completion levels rose. Suggestions are made concerning the relationship between on-task and task completion behaviors.

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THE MODIFICATION OF ON-TASK AND TASK COMPLETION BEHAVIORS IN AN ELEMENTARY-SCHOOL CHILD

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The use of systematic reinforcement techniques has been highly successful in modifying a variety of isolated target behaviors such as cooperative behavior (e.g., Hart, Reynolds, Baer, Brawley, & Harris, 1968), on-task behavior (e.g., Hall, Lund, & Jackson, 1968), and academic response rate (e.g., Lovitt & Curtis, 1969). Most of these studies were designed to measure changes only in the single behavior which was selected for modification. Recently, interest has developed in measuring several responses in a single subject, modifying only one, and then determining whether the remaining observed but non-manipulated behaviors also vary.

Some recent research on social and motor performance has provided evidence for positive changes in non-manipulated behaviors (e.g., Buell, Stoddard, Harris, & Baer, 1968; Twardosz & Sajwaj, 1972), as well as concurrent positive and negative changes (Sajwaj, Twardosz, & Burke, 1972). Most early classroom investigations were concerned with improving the on-task or study behaviors of children (e.g., Bushell,

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Wrobel, & Michaelis, 1968; Hall, Lund, & Jackson, 1968). Few data are available on possible corresponding changes in other non-manipulated academic behaviors (e.g., task completion, test performance). Recent attempts to examine this possibility have produced some conflicting data. Ferritor, Buckholdt, Hamblin, and Smith (1972) have looked at the relationship between on-task and task completion behaviors and determined, after modifying each of the behaviors separately, that allied changes do not occur in the non-reinforced behavior. In fact, on-task rate decreased when task completion was targeted for improvement. Their data, however, are hampered by the fact that baseline on-task levels averaged 80 percent, thus creating a ceiling effect by limiting the extent to which marked increases in on-task rate could occur. On the other hand, when Kirby and Shields (1972) applied contingencies directly to task completion behavior, increases were seen in on-task rate. Their study, however, was designed to show the economy of applying contingencies only to task completion behavior without first attempting to accelerate on-task performance. Thus, no data are available indicating whether or not task completion behavior would have increased if the targeted response had been on-task behavior.

The present study was originally designed to train a teacher to increase a child's on-task and task completion rates. It provides data which are partly supportive of the findings of both Ferritor et al. (1972) and Kirby and Shields (1972), but which suggest a somewhat different interpretation of the relationship between on-task and task completion behaviors. The data to be presented here will suggest that increases in on-task behavior do not automatically imply increases in task completion behavior, that specific contingencies are needed in order to improve task completion behavior, and that on-task behavior is a component of task completion behavior.

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Method

Subject and Setting

The subject, Lisa, was a seven-year-old child in a class of 29 first-grade children, located in a Pittsburgh, Pennsylvania public school. The school is a developmental school associated with the Learning Research and Development Center. The children were heterogeneously grouped with respect to achievement and ranged in age from 6.0 years to 8.5 years. Lisa was selected for study because she attempted and completed few of her assigned tasks and rarely exhibited on-task behavior.

Daily Program

A conceptual period ("work time") of one and one-half hours was conducted during the first part of each morning and afternoon. Each child had a prescription ("ticket") with his assignments for that day. The assignments were made on the basis of diagnostic pretests individually administered in each of the following curriculum areas: mathematics, classification, visual-motor skills, and writing. A reading assignment was included if the child had progressed through a series of individual tutoring sessions and was working in the programmed reading book. The number of tasks on the child's ticket depended on his past performance and teacher assessment of his ability. The tasks consisted of manipulative materials which were designed by the teacher. They were placed in boxes which were stored on shelves along the perimeter of the work area. Each child was responsible for keeping his ticket intact, finding his box, and raising his hand upon completion of each task. When the task was completed correctly, the teacher would pencil in a "star" on the child's prescription ticket, and the child would proceed with the next task.

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One of the teachers tested or tutored during the conceptual period while the other "traveled" (i.e., circulated among the children). The traveling teacher (second author of this paper) reinforced appropriate behavior, which included sitting in a chair, working quietly, attending to the task, and correctly completing the task and ticket. For the purposes of this investigation, the same teacher traveled each afternoon, when all data were collected.

An "exploratory" period during which children were free to engage in non-prescribed activities lasted for approximately 30 minutes, immediately following the conceptual period. Paint, crayons, books, blocks, building toys (Lego Blocks), and occasional special projects were available. To gain entry to the area, the child had to complete his ticket (i.e., have each of his tasks starred by the teacher). The child remained in the work area until he finished his ticket. The same contingency applied to a gym period scheduled two afternoons a week.[2]

Apparatus

The first author and two observers were present in the room for approximately one hour each afternoon, four days a week. The observers were not aware of the purpose of the experiment. They were stationed in the exploratory area to the rear of the room. In order to insure that the data to be recorded most closely represented "normal" classroom operations, the observers were instructed not to interact with the children and to avoid eye contact with them.

Data were collected by one observer, indicating the amount of on-task behavior exhibited by Lisa. She was observed for one continuous

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[2]This contingency was in effect only during the 1969-70 school year. It is not representative of the present operation of either the exploratory or gym periods.

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minute every third minute, with each minute being broken down into ten-second intervals. During the remaining two minutes, two other children were observed for one minute each. The order of observation was rotated on a daily basis. Only data on Lisa are reported here.

On-task behavior was defined as looking at, manipulating, or attending to work materials. A "W," representing work behavior, was recorded beside the child's name if he was on-task for the ten-second interval. He was permitted to look away for three seconds during the interval and still receive a "W." An "O" for non-work was recorded for any behavior incompatible with on-task behavior. Such behavior included walking around the room, aggression, or hand raising.

A second observer collected data on the teacher's interaction with Lisa. Data were recorded on a continuous basis, indicating each positive, negative, and neutral interaction made. Positive interactions were social in nature and involved either a praise statement (e.g., "That's good!" or "You're working very well!") or physical contact (e.g., a pat on the shoulder). Negative interactions included comments such as "That's wrong!" and "Sit in your seat and be quiet!" as well as physical actions (generally restraining a child or moving him to another location). Neutral comments included remarks directed towards academic behaviors (e.g., "How much is 2 + 3?") or statements of rules (e.g., "Those children who finish their tickets will be able to go to the play area.").

Reliability Check. Inter-observer reliability was computed by having the first author make a simultaneous observation record with each of the two observers. Reliability was computed by (# agreements x 100 ÷ # agreements + disagreements). Both observers had just completed a study in which identical recording procedures were used. Reliability for each, taken three times, was over 9. Because of the recency of the

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reliability checks and because the type of data recorded in the previous study was identical to that collected here, reliability was now recorded only once, during Reinforcement$_1$. It was 94 for on-task behavior and 91 for teacher contacts.

Design

Baseline. The teacher was instructed to maintain her traveling behavior as described above. She stated the rules which applied to the conceptual period immediately before the children began working. Praise statements were made to those children who began working quietly and were also intermittently made during the work period. Lisa received a daily assignment of three to five tasks.

Reinforcement$_1$. The teacher increased her positive social contacts with Lisa. The treatment consisted of the teacher making positive interactions contingent upon appropriate academic behaviors. Such behaviors included on-task behavior, getting and returning materials, and task completion. A carrel was also placed on Lisa's table to provide an isolated work area for her. The carrel was a three-sided wooden unit approximately 14" high. It prevented Lisa, when she was seated and facing front, from seeing other parts of the room. At the time the carrel was placed on her desk, about one-third of the other students also had carrels on their desks. Carrels had been used rather frequently throughout the year, and they were not viewed by either the teacher or the students as punitive devices. The same number of daily tasks (three to five) was assigned as in the baseline phase.

Reinforcement$_2$. Lisa was presented with a prescription containing three tasks. She was told that if she completed the three tasks on her ticket, she could go to the play area and be the first child taken for

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individual reading the next morning. The procedure was explained to Lisa at the beginning of each work period, and she was also reminded of the terms several times during the work period. Although neither the teacher nor Lisa signed the prescription, the technique was essentially a contingency contract (e.g., Homme, Csanzi, Gonzales, & Rechs, 1969). All other aspects of Reinforcement$_1$ remained in effect. The teacher was requested to maintain the same number of positive interactions per session as in Reinforcement$_1$.

Reinforcement$_3$. The number of tasks on the ticket was increased to four. The teacher was asked to maintain her behavior as described in Reinforcement$_2$.

Results

Figure 1 presents Lisa's daily on-task and task completion behavior for all phases of the study. It can be seen that Lisa displayed a rather low but stable rate of on-task behavior during baseline (mean rate of 27.6 percent). Task completion rate was extremely low, with only three tasks completed during eleven days of baseline.

During Reinforcement$_1$, it can be seen that Lisa's on-task behavior accelerated and stabilized over the first three days of the phase. In the final two days, a lower rate is shown, but one which still equalled or exceeded all but two days during baseline. In spite of the general increase in on-task behavior during the entire phase (mean of 45.0 percent), task completion rate showed no change. Lisa completed only one task during the five days of this phase.

During Reinforcement$_2$, Lisa's on-task rate was stable throughout and averaged 45.0 percent. This closely approximated her level of

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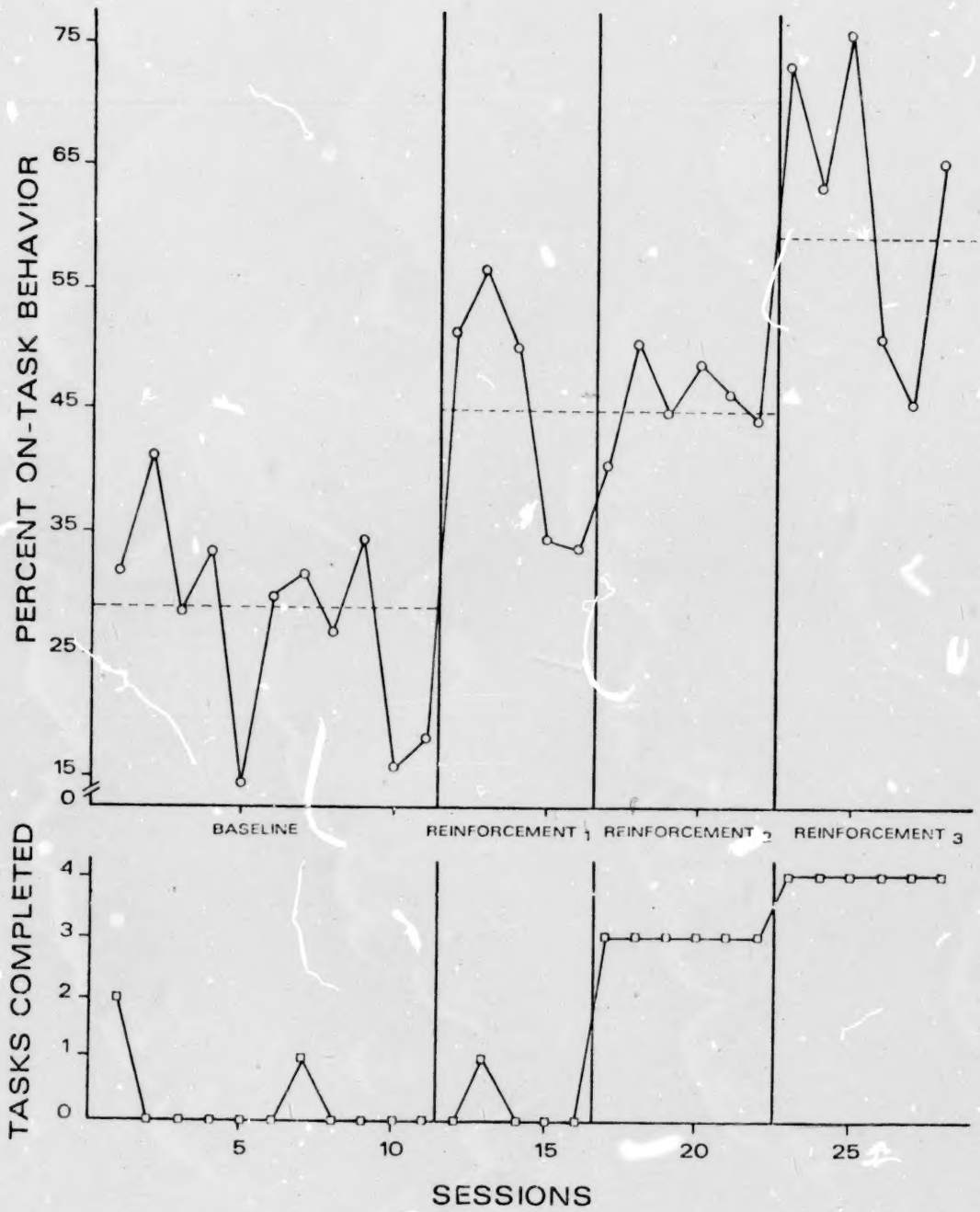

Figure 1. A Record of Lisa's On-Task and Task Completion Behavior.

Baseline - Before experimental procedures

Reinforcement$_1$ - Use of a carrel and increased attention for on-task behavior

Reinforcement$_2$ - Same conditions as Reinforcement$_1$ with addition of contingency contract

Reinforcement$_3$ - Same conditions as Reinforcement$_2$ with revised contract

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on-task behavior during Reinforcement$_1$. Her task completion level, however, in contrast to the preceding stage, was at a maximum. She completed all three assigned tasks for each of the six days of the phase.

During Reinforcement$_3$, Lisa's on-task rate increased, averaging 62.1 percent over the six days in this stage. Task completions were again at a maximum, with all assigned tasks completed each day.

Figure 2 presents the daily positive and negative contacts that the teacher made with Lisa throughout the study. Both types of contacts were stable throughout baseline, with daily means of 8.8 and 2.7 positive and negative interactions, respectively.

Figure 2 indicates that during Reinforcement$_1$, teacher positive contacts initially increased markedly, reaching a peak on the third day of the phase, while negative contacts for these three days remained at baseline level.

Since Lisa's on-task rate had stabilized after the first three days of Reinforcement$_1$, the teacher determined that the difference between her positive contacts on days one and three (19 versus 45) was both unnecessary and time consuming. She thus reduced her positive contacts over the final two days to a rate which equalled that of the first day of Reinforcement$_1$. Negative contacts, however, increased on the last two days of Reinforcement$_1$ to the highest level seen in the study. Lisa's reduction in on-task rate on those two days could have been related to the increase in negative contacts. Nevertheless, the positive contacts she received on the two days were sufficient to maintain her on-task rate at a level above baseline performance. During Reinforcement$_1$, there were means of 29.0 positive and 6.2 negative contacts per day.

In the Reinforcement$_2$ phase, teacher positive contacts remained at the level seen during the last two days of Reinforcement$_1$, with a mean

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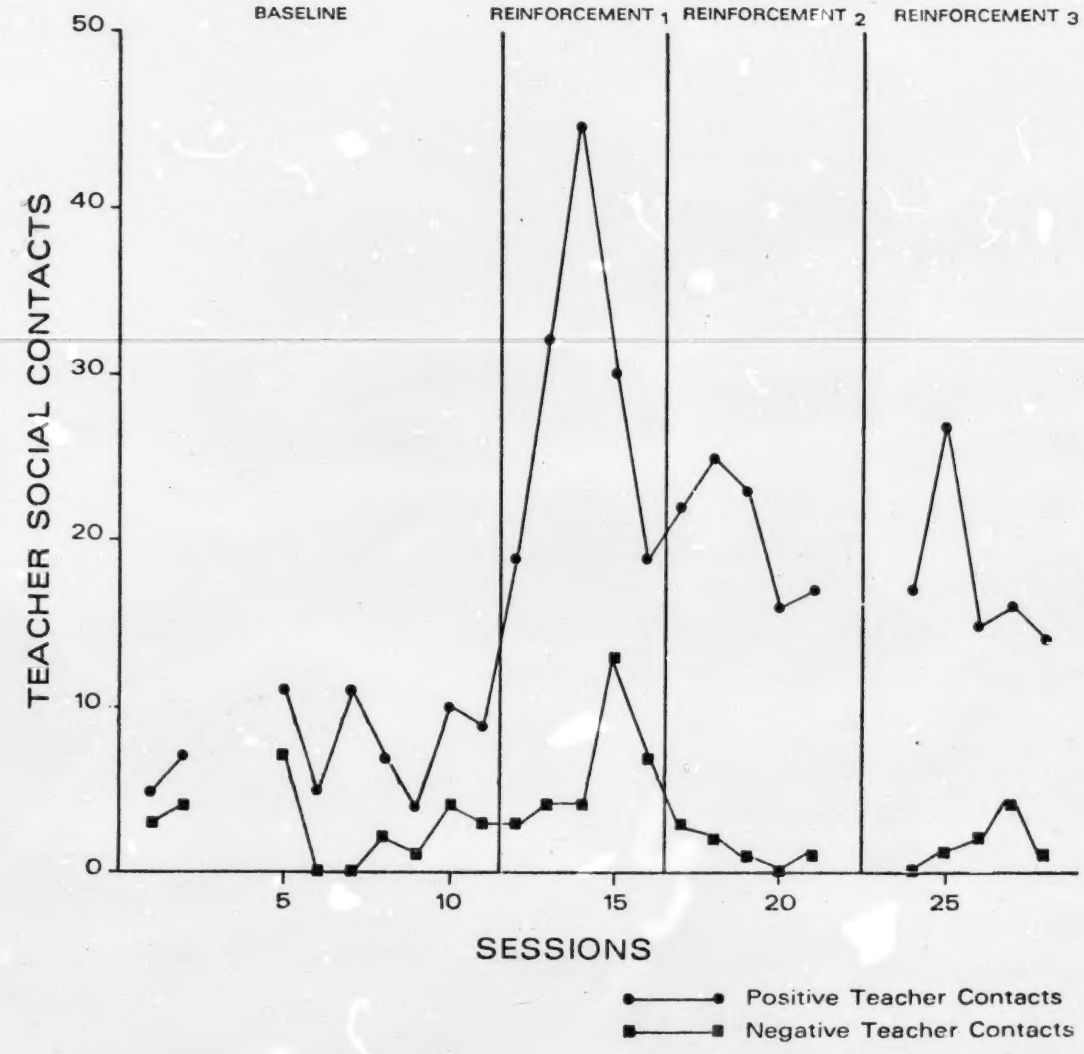

Figure 2. A Record of the Teacher's Positive and Negative Social Contacts with Lisa.

Baseline - Before experimental procedures
Reinforcement$_1$ - Use of a carrel and increased attention for on-task behavior
Reinforcement$_2$ - Same conditions as Reinforcement$_1$ with addition of contingency contract
Reinforcement$_3$ - Same conditions as Reinforcement$_2$ with revised contract

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of 20.6 per day. Negative contacts averaged 1.4 per day, slightly below baseline level.

Teacher daily positive contacts remained stable (mean of 17.8) during Reinforcement$_3$, as did daily negative contacts (mean of 1.6).

Discussion

It was demonstrated in Reinforcement$_1$ that praise and a carrel accelerated on-task rate. These two variables, however, were insufficient to produce increased task completion behavior. Since praise level was stabilized at the end of Reinforcement$_1$ and remained relatively constant during the remaining phases, it can be argued that the additional observed changes in on-task rate and the marked rise in task completion behavior were produced by the contingency contract. Thus, it appears likely that while praise and the use of a carrel initially increased on-task rate, a contract increased both on-task and task completion behaviors.

Several tentative conclusions about the relationship between on-task and task completion behaviors seem warranted by the data. First, it appears that an increase in on-task rate, as seen in Reinforcement$_1$, does not automatically imply an accompanying positive change in rate of task completion. These data correspond with those reported by Ferritor et al. (1972). It is, therefore, suggested that when applied studies focus on accelerated on-task levels, correlated changes in task completion rates should not necessarily be expected and, at the least, should be examined separately.

Second, the on-task levels in Reinforcement$_1$ and Reinforcement$_2$ were similar. Task completion levels in these two phases, however, were

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markedly different. This suggests that even if on-task level is of a sufficient magnitude for task completion behavior to occur, task completion may not occur unless a specific contingency has been designed. When Ferritor et al. (1972) applied contingencies to task completion behavior, they found a decrease in on-task behavior. One possible explanation for the discrepancy is that Ferritor et al. had baseline on-task rates of over 80 percent. A ceiling effect may have been created and downward fluctuations may have resulted. More likely, however, is the fact that some of the behaviors considered on-task by Ferritor et al. (e.g., looking toward the teacher when she was talking, sharpening a pencil, and passing out papers) may have been incompatible with and unrelated to task completion behavior.

Thus, during the Ferritor et al. task completion phase, it was perhaps less likely that children would have engaged in such "on-task" behaviors. Hence, the decrease in on-task behavior might have resulted from the authors' particular definition of on-task behavior. In the present study, on-task behaviors were defined as closely as possible as behaviors which actually contributed to task completion.

On the other hand, Kirby and Shields (1972) demonstrated a marked rise in on-task behavior when contingencies were applied to task completion behavior. The present study supports this finding, not in Reinforcement$_2$, but in Reinforcement$_3$. Of greatest interest is the fact that during Reinforcement$_2$, when the contract was first applied, the child did not have to increase her on-task rate in order to meet the contract requirements. It is, therefore, suggested that given a certain level of on-task behavior, such as seen in Reinforcement$_1$ and Reinforcement$_2$, a range of tasks, from zero to three, could have been completed. However, when the requirement was raised to four tasks in Reinforcement$_3$, the

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on-task level of 45 percent proved insufficient and an increase was observed. Thus, while these data support Kirby and Shields (1972), they add a finer dimension which suggests that on-task behavior will accelerate as needed in order to facilitate task completion.

Although vigorous control procedures (e.g., reversal or multiple baseline designs) were not used, teacher social contacts were monitored with sufficient care so as to increase the probability that the contingency contract was primarily responsible for the observed changes in Reinforcement$_2$ and Reinforcement$_3$.

The findings of this study suggest that on-task behavior is a component of task completion behavior, and that on-task behavior is necessary but not sufficient for the development of task completion behavior. Furthermore, a range of tasks can be completed at a given level of on-task behavior.

Although the present investigation provides new evidence on the relationship between on-task behavior and task completion behavior, more data are needed to substantiate these findings. In addition, future studies should consider the relationship between the dependent variables in a variety of subject areas and for both high and low achieving students at various educational levels.

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